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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,923	03/26/2001	Michael P. Caren	10981712-2	4359

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AGILENT TECHNOLOGIES, INC.
Legal Department, 51 UPD
Intellectual Property Administration
P.O. Box 58043
Santa Clara, CA 95052-8043

EXAMINER

SIEW, JEFFREY

ART UNIT	PAPER NUMBER
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1637

DATE MAILED: 09/16/2003

18

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/819,923

Applicant(s)

CAREN ET AL.

Examiner

Jeffrey Siew

Art Unit

1637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-24,27,28 and 31-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-24,27,28 and 31-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. The request filed on 7/8/03 for a Request for Continued Examination (RCE) under 37 CFR 114 is acceptable. An action on the RCE follows. Pending claims to be examined are 22-24,27,28 and 31-48.

Claim Objections

2. In claim 1 the term substrate surface does not have proper antecedent basis. For consistency, correction is required.

Rebuttal

3. The response filed 7/8/03 has been fully considered and deemed not persuasive. The response has amended claims to recite “onto a nucleic acid array comprising a plurality of nucleic acids stably attached onto an array surface”. The limitation does not obviate the rejection over the combination of Milton and Deeg et al prior art. The response contends that the phrase means an “**already prepared array**”. The language **does not** necessarily impart such a limitation. The limitation may still read on Milton and Deeg et al combined method of manufacturing. For example, during a mid point in the Milton and Deeg et al manufacturing process, the array would have some nucleic acid already stably associated with surface and would be subject to more fluid containing nucleic acids to bind to Milton’s surface. Nevertheless,

Art Unit: 1637

during the process, the Milton's array would be an array with least some part having nucleic acids stably associated attached to the surface. Moreover, the response states that the nucleic acids are capable of hybridizing to their nucleic acid complement. The teachings of Milton et al state that the nucleic acids are capable of binding to complementary DNA (see col. 22 line 40 & 41). Finally, they state that Deeg et al do not teach nucleic acids. However, Deeg et al do teach the use of jet chamber for application of biochemicals. Given the state of the art at the time the inventions was made and Milton et al statement that applying thermal inkjets in its application of oligonucleotides (see col. 12 line 56-62) and Deeg et al's advantages in allowing measured application of biochemicals in large, one of ordinary skill in the art would have been motivated to apply Deeg et al's jet method to Milton's oligonucleotides to apply large number of oligonucleotides on an array in quick and efficient manner. As the response has relied on the same arguments for the other standing 103 rejections, the 103 rejections are maintained. The response may choose to focus on amending claim language to recite the application of nucleic acids from the ink jet to bind nucleic acids to oligonucleotides on an already prepared array, provided proper support lies in the specification. Moreover, such language would entail new search and consideration.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1637

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 22,23,27,28,31,34, 37,38, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milton (US 6,146,833 Feb. 11, 1997) over Deeg et al (US5,338,688 August 16, 1994).

Milton teach a method of depositing a quantity of fluid containing a nucleic acid onto a substrate array (Figure 7) having plurality of binding agents stably associated therewith comprising position a thermal inkjet (see abstract & col. 11 lines 8-10 teaching binding oligonucleotides to support activated with acyl fluoride functionalities & col. 12 lines 55-62 which explicitly teach using thermal inkjet printing techniques available in the art).

Milton et al do not explicitly teach actuating thermal inkjet head to expel.

Deeg et al teach a method of depositing biochemical analytical liquid such as containing a protein to a target using a jet from a jet chamber in which a partial volume of liquid in chamber is evaporated and expanded prior to ejection which would provide back pressure (see abstract & claim 1). The jet head contains a chamber and a jet orifice which is connected to reservoir (see

Art Unit: 1637

Fig. 1). They teach that a Hewlett-Packard Quiet Jet plus ink-jet printing head which is thermal inkjet is used (see column 6 line 59). They teach forming a droplets in predetermined pattern (see claim 3). They also teach various reagents including wash solution. They teach that the device is used to bind biotinylated reagents to a surface coating containing streptavidin (see col. 5 line 49-51). They measure changes as result of reagent between sample and reagents (see claim 16).

One of ordinary skill in the art would have been motivated to apply Deeg et al's teaching of loading thermal inkjet to deposit the oligonucleotides of Milton et al in order to automate large deposition of oligonucleotides to arrays. As the Milton explicitly states applying thermal inkjets, it would have been prima facie obvious to apply Deeg et al's thermal inkjet to deposit Milton et al's oligonucleotides to deposit large quantities to arrays.

5. Claims 24,32,33,35,36, 39-43 & 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Milton (US 6,146,833 Feb. 11, 1997) over Deeg et al (US5,338,688 August 16, 1994) in further view of Cornell (US6,132,030 Oct. 17, 2000) .

The teaching of Milton and Deeg et al are described previously.

Milton et al do not teach uJ of heat..

Cornell teach the use of specific power requirements in determining the heat power density for ejecting from thermal inkjet.

One of ordinary skill would have been motivated to apply Cornell teaching of power to apply various heat power density to the combined invention of Milton and Deeg et al's inkjet device in order to optimize the ejection quality. Cornell states that controlling the heat increases quality by maximizing ink droplet velocity and increasing nucleation time (see col. 1 line 36-

Art Unit: 1637

col. 2 line 5). It would have been prima facie obvious to use the Cornell teachings of the power heat variables to print quality to increase the quality of expelling in Milton et al's method of using thermal inkjet depositing.

SUMMARY

6. No claims allowed.

CONCLUSION

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Siew whose telephone number is (703) 305-3886 and whose e-mail address is Jeffrey.Siew@uspto.gov. However, the office cannot guarantee security through the e-mail system nor should official papers be transmitted through this route. The examiner is on flex-time schedule and can best be reached on weekdays from 6:30 a.m. to 3 p.m. If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached on (703)-308-1119.

Any inquiry of a general nature, matching or filed papers or relating to the status of this application or proceeding should be directed to the Tracey Johnson for Art Unit 1637 whose telephone number is (703)-305-2982.


Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center located in Crystal

Application/Control Number: 09/819,923

Page 7

Art Unit: 1637

Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Center numbers for Group 1600 are Voice (703) 308-3290 and FAX (703)-308-4242.


JEFFREY SIEW
PRIMARY EXAMINER

September 16, 2003